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Fish Meal and Oil Market Review

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FISH MEAL AND OIL MARKET REVIEW

U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary

National Oceanic and Atmospheric Administration
Richard A. Frank, Administrator

National Marine Fisheries Service
Terry L. Leitzell
Assistant Administrator for Fisheries

Prepared by

Fisheries Development Division
John T. Everett, Chief

Market Analysis Group
John Vondruska, Chief

Principal contributor
John Vondruska
Phone: (202) 634-7353

Research Assistant
James S. Roberts

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SUMMARY

U.S. production of fish meal, solubles, and oil reached record or near-record levels in January-October 1978, well above a year earlier and the 1972-76 average. The improvement was attributed to excellent landings and oil yields for menhaden. At the same time, U.S. exports of fish oil recovered sharply. Because of good U.S. supplies, low world supplies, favorable prices, and strong world demand for fish meal--a market situation that has prevailed since the third quarter of 1977--U.S. exports of fish meal have exceeded imports during each quarter since the fourth quarter of 1977.

World production of fish meal probably was slightly higher in 1978 than in 1977 and close to the 1972-76 annual average of about 4.4 million metric tons, but world exports of fish meal in 1978 likely will continue the tendency to decline that began in 1975. On the other hand, world exports of fish oil probably were significantly higher than in 1977.

World production of fish meal in 1979 likely will be about the same as in 1978, and world exports could be slightly lower. World exports of fish oil probably will be lower in 1979 than in 1978. U.S. production of fish meal, solubles, and oil likely will be closer to normal levels in 1979, below the very high levels of 1978. These expectations suggest market strength and high U.S. exports in 1979.

The markets for all high-protein meals and all fats and oils will affect the prices of fish meal, solubles, and oil in 1979. World markets for high-protein meals and fats and oils are large, and fishery products represent only a small part of the trade. According to some sources, world production of all high-protein meals and all fats and oils will be about 5 to 6 percent higher in the 1978/79 crop year than in the previous crop year. This will depend, in particular, on the size of the soybean crops that will be harvested in the early months of 1979 in Argentina and Brazil. If world use of high-protein meals and fats and oils does not increase as rapidly as production in 1979, conditions may develop that would cause prices of these products to weaken.

FISH MEAL

REVIEW: JANUARY-OCTOBER 1978

U.S. production and exports of fish meal were well above both 1977 and 1972-76 average levels in the first 10 months of 1978 (table 1). Imports were down substantially.

Domestic Production

U.S. production of fish meal reached a record 330,000 short tons in January-October 1978, surpassing the previous annual record of 312,000 short tons in 1962.

Higher landings of menhaden accounted for the increase in the U.S. production of fish meal. According to preliminary figures, landings in the Gulf of Mexico reached a record 1.8 billion pounds when the 1978 Gulf season closed in mid-October. This is well above the 1.0 billion pounds of 1977, and the 1972-76 average of 1.2 billion pounds. On the Atlantic Coast, the catch in January-October reached about 659 million pounds, 2 percent below the above-average level of 1977. Production of menhaden meal was about 270,000 short tons in January-October 1978, 82 percent of total U.S. production.

Production of tuna-mackerel meal in the first 10 months of 1978 was about 39,000 short tons, 21 percent above a year earlier, and 11 percent above the 1972-76 average. Cannery receipts of tuna and bonito have been high, well above receipts in 1977 when tuna purse seine vessels were inactive for about 2 months because of court litigation on the level of incidental catch of porpoises. These cannery receipts include both domestic and imported fish, and they are used mostly in making canned products for human consumption, but some parts of the fish are suitable only for byproducts, such as pet food, fish meal, and fish oil. Cannery receipts from the mackerel purse seine fishery in California in January-October 1978 were about 35,000 short tons, 18 percent below a year earlier, but more than twice the 10-month receipts in 1976. About two-thirds of the 10-month receipts of mackerel occurred from July to October 1978, because fishing for both mackerel and anchovy decreased in the first half while price negotiations between fishers and processors took place.

Low landings of anchovy resulted in the sharp decline in U.S. production of anchovy meal in January-October 1978. This period includes portions of two seasons of the California anchovy reduction fishery (August to May). For the season ending May 15, 1978, fishing effort decreased significantly because of the negotiations between fishers and processors. The new season began in August 1978, but landings through October were only 3,000 short tons and included small fish with low oil content, which resulted in low prices. Therefore, fishing effort was directed toward other species. It is not clear that the lower quota influenced fishing effort. The quota for the anchovy catch was set at 57,333 short tons for reduction for the entire season (August 1978 to May 1979), a 50-percent decrease from the year-earlier quota of 115,000 short tons.

Table 1.--U.S. supplies of fish meal (excluding shellfish meal), January-October, 1977 and 1978, with the 1972-76 average

Component	1972-76 average	1977	1978
	- - -Thousand short tons- - -		
Production			
Menhaden 1/	189.6	184.1	269.8
Anchovy	12.1	11.8	0.6
Tuna-mackerel	35.3	32.3	39.2
Unclassified	22.6	19.7	20.1
Total	259.6	247.9	329.8
Imports	143.1	75.2	32.4
Total new supplies	402.7	323.1	362.2
Exports	22.8	30.5	46.2
Net supplies	379.9	292.6	315.9

1/ May include small quantities made from other species.

U.S. Imports and Exports

The United States imported about 32,000 short tons of fish meal in the first 10 months of 1978, 57 percent below a year earlier, and 77 percent below the 1972-76 average. Fish meal has not been received from Peru since the first quarter of 1977, although Peru was the world's leading exporter of fish meal in 1978, and has been the leading supplier of imports to the United States for many years. The United States has not received imports of fish meal from Norway, the world's second leading exporter in 1978, since the third quarter of 1977. Canada has been the leading supplier of imported fish meal to the United States since the third quarter of 1977, accounting for 86 percent of the imports in January-October 1978.

The United States exported about 46,200 short tons of fish meal in January-October 1978, 52 percent above a year earlier, and 102 percent

above the 10-month average for 1972-76. The Federal Republic of Germany (West Germany) was the leading buyer (about 28,600 short tons), followed by Egypt (about 11,300 short tons). U.S. exports of fish meal have exceeded imports in each quarter since the fourth quarter of 1977.

Developments in Major Trading Countries

Total production of fish meal for six of the major exporting countries was 1.2 million metric tons in the first 9 months of 1978, about 4 percent more than in 1977 (table 2; includes Chile, Iceland, Norway, Peru, and South Africa and Namibia [South West Africa]). Both exports and domestic use declined, resulting in a sharp increase in inventories. Including Denmark, seven countries accounted for about 75 percent of the world's exports of fish meal in 1977, and about 40 percent of the world's production. Exports by these seven countries were 1.04 million metric tons in January-September 1978 compared with 1.09 million metric tons in 1977.

Among the major exporting countries, Norway showed the greatest decline in exports (down 33 percent or about 108,000 metric tons) and production (down 32 percent or 123,000 metric tons), comparing data for January-September 1978 and a year earlier. Chile recorded the largest increase in exports (up 25 percent or about 44,000 metric tons) and production (up 58 percent or about 102,000 metric tons), and also accounted for most of the growth in inventories. Production in South Africa and Namibia (South West Africa) was 6 percent higher, but only 1,000 metric tons were exported, while inventories rose to about 82,000 metric tons at the end of September 1978, twice the year-earlier level.

Table 2.--Supply and use of fish meal for six major exporting countries, January-September, 1977 and 1978

Component	1977	1978
	--Thousand metric tons--	
Beginning stocks	329.3	290.3
Production	1,174.6	1,224.5
Total supply	1,503.9	1,514.7
Exports	872.8	828.8
Domestic use	243.7	193.4
Total use	1,116.6	1,022.2
Ending stocks	387.8	493.8

Note: Includes Chile, Iceland, Norway, Peru, and South Africa and Namibia (South West Africa). See appendix for details.

Japan was the second leading buyer of fish meal from major exporting countries in 1977, having tripled its total imports from the 1972-76 average. However, Japan substantially reduced its imports to 76,000 metric tons in January-September 1978, 46 percent less than a year earlier (table 3). The reduction in Japanese imports may have occurred primarily because of improvements in domestic production, and not because of any weakening in demand. Domestic use of fish meal in Japan is higher than in any other country, but Japan has not been as dependent on imports as some other countries, because of high domestic production. In 1977, Japan's reaction to reduced access to resources within the extended jurisdiction zones of other countries included a determined effort to secure stable supplies of fish meal from foreign sources. With the incentive of relatively high domestic prices and improving exchange rates, Japan imported more than three times as much fish meal in 1977 as in 1976 (178,500 vs. 56,600 metric tons) and exports fell from 49,000 to 37,500 metric tons. Japanese production, including fish meal and dried press cake, actually rose to 761,000 metric tons in 1977 from 738,000 metric tons in 1976. This appears to have resulted from increased production of fish meal from the larger-than-anticipated catch of sardines that offset the reduced catch of Alaska pollock. The sardine catch was higher in 1978 than in 1977, and it is likely to continue high for several years. This is one of the reasons why the price of fish meal in Japan has been falling since December 1977. The price in August-September 1978 was about 89,000 yen per metric ton, well below the price of roughly 140,000 yen in March-November 1977, and closer to the 1976 average price of about 97,000 yen. These price changes appear to relate to the increased supplies of fish meal in Japan, and to the adjustment of prices of fish meal in Japan in comparison with prices of fish meal in other countries and the prices of other high-protein meals in Japan. The demand for feed ingredients is growing, as suggested by the fact that the domestic disappearance of oilseed meals was 7 percent higher in the 1977/78 crop year than in the previous crop year.

The Federal Republic of Germany (West Germany) imported about 174,000 metric tons of fish meal in January-September 1978, 11 percent less than a year earlier; the United Kingdom imported about 137,000 metric tons, 15 percent less. These changes appear to be related primarily to the supply situation for fish meal compared with other high-protein meals, because the Federal Republic of Germany's net imports of

Table 3.--Domestic use and imports of fish meal for selected countries, 1972-76 annual average, and imports in January-September, 1977 and 1978

Country	1972-76 annual average		Imports	
	Domestic use	Imports	Jan.-Sept. 1977	Jan.-Sept. 1978
	- - -Thousand metric tons- - -			
Japan	811	60	141	76
U.S.S.R.	560	10	14	--
East European countries	557	480	311	319
United States	444	143	66	28
Fed. Rep. of Germany	372	344	205	182
United Kingdom	337	263	161	137
Total	3,081	1,300	898	742
World Total	4,405	2,264	--	--

Note: Includes fish solubles on a dry weight basis. The East European countries include Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, and Yugoslavia. Data for some countries are estimated.

all high-protein meals (including fish meal) rose 18 percent, and the United Kingdom's net imports rose 7 percent.

World Demand and Supply

World demand for fish meal was higher in 1978 than in 1977, although there were declines in imports of fish meal in January-September for some of the leading consuming and importing countries (table 3). These declines may be explained primarily by supply-related factors, including the effect of competition from other countries that increased their imports. The largest declines in imports were for Japan and the United States. As already indicated, these two countries experienced improvements in domestic production and supplies that were more than enough to allow both reduced imports and increased exports in January-September 1978 (tables 3 and 4). On the other hand, the Federal Republic of Germany and the United Kingdom, whose supplies of fish meal are more dependent on imports than those of Japan and the United States, apparently increased feed production without importing more fish meal in 1978. This was possible because total world supplies of all high-protein meals were higher in 1978 than in 1977, although world exports of fish meal apparently continued on a downward trend in 1978 as in 1975-77 (2.21, 2.12, and 2.00 million metric tons, respectively).

Despite the apparent decline in total world trade of fish meal in 1978, some countries increased their imports, including the East European countries, which are leading users and importers (table 3), and Cuba and other Latin American countries, Iran, People's Republic of China, and Taiwan (appendix table A-9).

Because many leading consuming countries are heavily dependent on imports, world exports are a reasonable measure of world market supplies. Exports of fish meal by the seven major producing-exporting countries were lower in January-September 1978 than a year earlier, and the decline was only partly offset by increased exports from other countries (table 4). Thus, world market supplies were lower, although world production of fish meal in 1978 probably was about the same or slightly higher than in 1977 (4.46 million metric tons) and close to the 1972-76 average (4.38 million

Table 4.--Exports of fish meal by selected countries, January-September, 1977 and 1978, with the 1972-76 annual average and 1977 annual exports

Component	Jan.-Sept.		1972-76 annual average	1977 annual
	1977	1978		
	- - -Thousand metric tons- - -			
FEO countries 1/				
Chile	119	163	107	199
Iceland	113	141	93	149
Norway	323	215	343	450
Peru	308	308	770	395
South Africa	9	1	101	9
Total	873	829	1,414	1,202
Denmark	214	209	247	264
Other countries				
Canada	19	27	31	28
Japan	21	37	35	38
United States	17	36	27	33
Fed. Rep. of Germany	42	44	62	59
Total above countries	1,186	1,181	1,822	1,624
World total	--	--	2,187	2,003

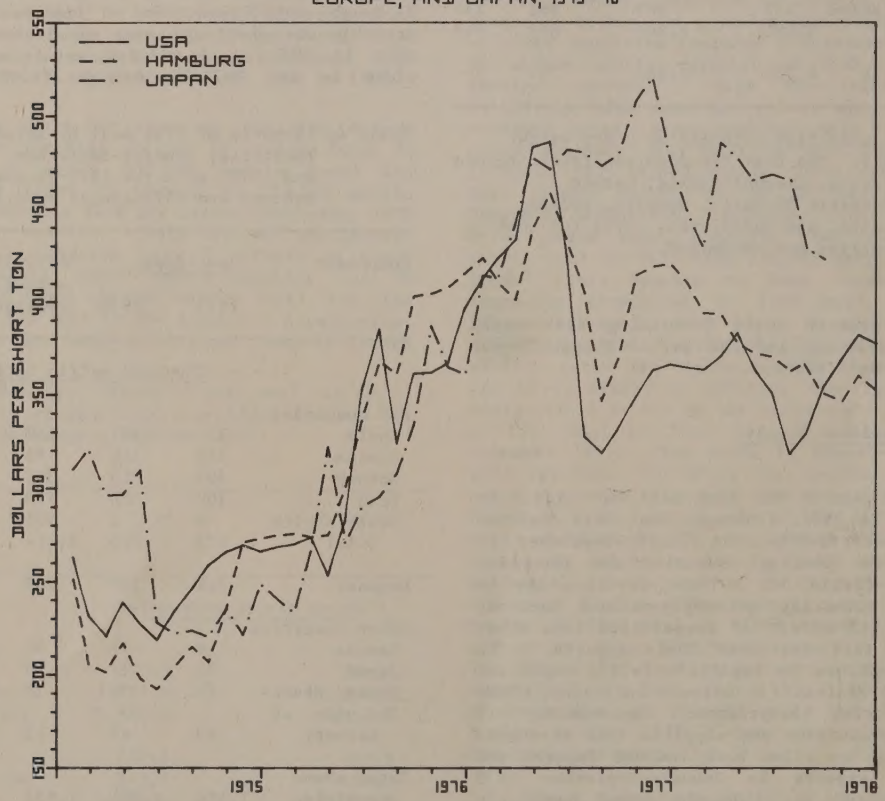
1/ Countries that are members of the Fishmeal Exporters Organization (FEO). Figures for Namibia are counted with those for South Africa.

metric tons). Of course, some of the increased 1978 production is being held in inventory by the major exporting countries. There were increased ending inventories for January-September 1978 compared with a year earlier, and they were held by Chile, Peru, and South Africa and Namibia. It is unlikely that much of the inventories in South Africa and Namibia will be available for export because of the government-imposed requirement for meeting domestic demand first.

Prices

The price of menhaden meal in the United States increased from $318 per short ton in August 1977 to $383 in April 1978, then declined to $318 in July (fig. 1). After July, the price moved upward, reaching $384 per short ton in November 1978 and strengthening compared to soybean meal prices (fig. 2). The price of fish meal in Hamburg, Federal Republic of Germany, a representative European price, moved downward from December 1977 to October 1978; the price was about $361 per short ton in November 1978. The price in Japan was significantly higher than prices in Europe and the United States in 1977, but the gap has been narrowing. The price for fish meal in Japan was $423 per short ton in September 1978, compared with $355 per short ton for menhaden meal in the United States and $351 per short ton for fish meal in Europe. A year earlier, the prices were $479 per short ton in Japan, $332 in the United States, and $370 in Europe.

Figure 1.--PRICES OF FISH MEAL IN THE UNITED STATES, EUROPE, AND JAPAN, 1975-78



Hamburg: 65 percent protein, any origin, c & f.

United States: 60 percent menhaden meal, bulk, quoted by brokers at New York City, f.o.b. East Coast and Gulf plants.

Japan: Average unit value of fish meal imported into Japan.

OUTLOOK

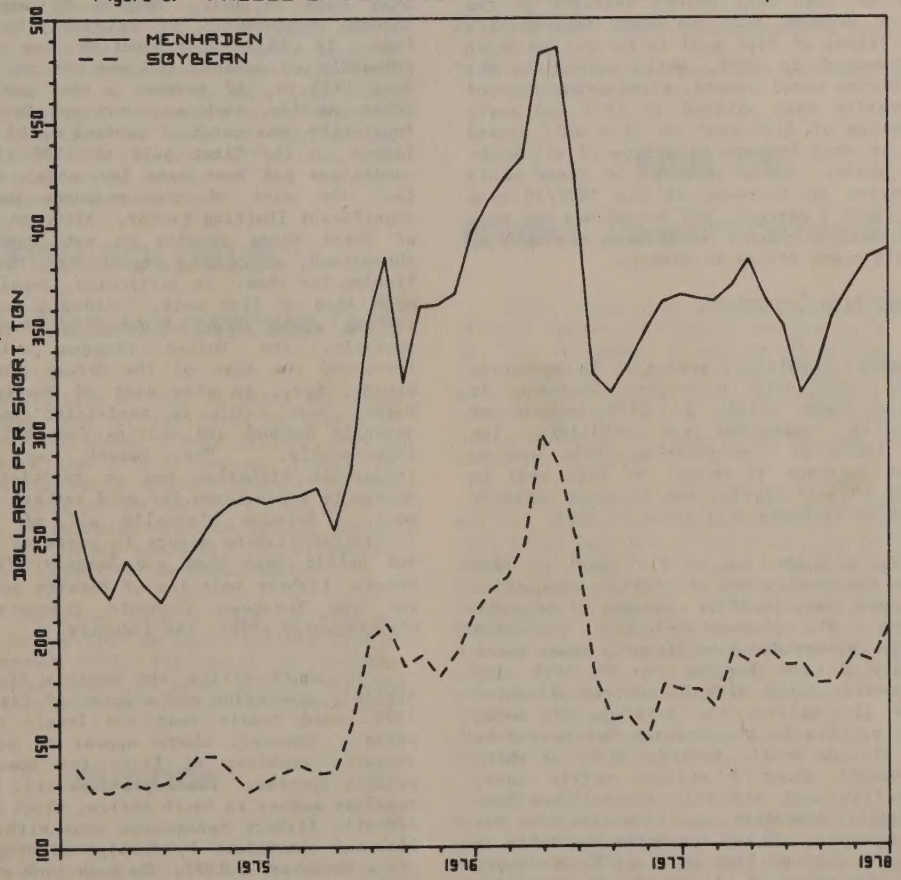
U.S. Production

With 2 months remaining, U.S. production of fish meal in 1978 (329,000 short tons) already had surpassed the previous annual record of 312,000 short tons of 1962. Production in 1979 is likely to be below the 1972-76 average of 285,000 short tons. Preliminary estimates by NMFS biologists suggest that landings of menhaden, which accounted for most of the increase in total U.S. production of fish meal in 1978, could be closer to normal in 1979, i.e., production of menhaden meal could be near the 1972-76 average of about 200,000 short tons in 1979. Production of tuna-mackerel meal could be close to the 1972-76 average of about 40,000 short tons in 1979. Production of unclassified fish meal was below the 1972-76 average level in 1977 and 1978; production could be 22,000 short tons in 1979 if that pattern continues. Because of lower catch quotas, production of anchovy meal is likely to be far below the 1972-76 average, perhaps no more than 10,000 short tons in 1979.

World Supplies

World production of fish meal in 1979 probably will be close to the average of recent years, about 4.4 million metric tons, and world

Figure 2.--PRICES OF MENHADEN MEAL AND SOYBEAN MEAL, 1975-78



Menhaden meal: 60 percent protein, bulk, f.o.b., East Coast ports.

Soybean meal: 50 percent protein, bulk, Decatur, Ill.

exports, about 2 million metric tons, could continue to decline slightly as in 1975-78. For the seven countries that accounted for about 75 percent of the 1972-76 average world exports, aggregate production of fish meal probably will decline from 1977-78 levels in 1979. Higher beginning inventories in these countries, and higher production in other countries could offset that possible decline. Several countries have increased their production and exports of fish meal in the 1972-77 period; they include Ecuador, Mexico, Panama, and Thailand.

Prices

Because world supplies of fish meal in 1979 probably will remain relatively close to the average of recent years, there seems to be little reason to expect much change in the strength of fish meal prices relative to the prices of soybean meal and other high-protein meals. Prices of fish meal in Europe and Japan moved downward in 1978, while prices in the United States moved upward, eliminating some of the disparity that existed in 1977 and early 1978. Prices of fish meal in 1979 will depend largely on what happens to prices of all high-protein meals. World supplies of these meals are expected to increase in the 1978/79 crop year by about 5 percent, but demand may not grow as fast. As a result, conditions may develop that would cause prices to weaken.

Major Exporting Countries

Resource conditions appear to be improving in Peru, but only a modest increase in production seems likely in 1979 because of interest in conserving and rebuilding the anchovy resource. Neighboring Chile had an excellent increase in output of fish meal in 1978 from 1976-77 levels, but it seems unlikely that such an increase will occur in 1979.

Norway's production of fish meal in 1978 was below the high levels of 1976-77; production will be even lower in 1979. Because of resource conditions, the Norwegian-Soviet Fisheries Commission recommended significantly lower catch of capelin in the Barents Sea in 1979 (1.8 million metric tons) with 60 percent allocated to Norway (1.1 million metric tons). The total catch of capelin in the Barents Sea peaked at about 3 million metric tons in 1977, of which Norway caught about 2 million metric tons. Norway's fish meal and oil industry has been predominantly dependent upon the Barents Sea capelin resource. Other resources available to the industry include blue whiting, Norway pout, sandeel, and sprat in the North and Norwegian Seas. Among these, the catch of blue whiting increased significantly in 1978. The blue whiting catch could reach about 200,000 metric tons in 1979, but this is not enough to offset much of the decline in the catch of capelin from the Barents Sea. Besides the blue whiting, other possibilities for improving the resource base for the Norwegian fish meal and oil manufacturing industry may exist. For example, some representatives of the Norwegian industry have suggested that the fishing zone around Jan Mayen be extended from 12 to 200 miles. Jan Mayen, located about equidistant from Greenland, Iceland, and Norway, is a Norwegian island with surrounding blue whiting and capelin resources that have supported good catch rates.

Iceland's fish meal and oil manufacturing industry is dependent on resources within its 200-mile fishery management zone. Iceland's production of fish meal in 1979 could be about the same as in 1978.

Danish production of fish meal was lower in 1978 than in 1977, judging by export data through September. It is likely to be even lower in 1979. Production now is based primarily on sandeel (60 percent in January-June 1978 vs. 47 percent a year earlier) and other species, such as sprat and Norway pout. Apparently, the catch of sandeel would have been larger in the first half of 1978 if weather conditions had been more favorable, suggesting that the size of the resource was not a significant limiting factor. Although resources of these three species do not appear to be threatened, there are regulations that affect fishing for them. In particular, regulations on mesh size of fish nets, incidental catch, and fishing areas affect fishing for Norway pout. Recently, the United Kingdom unilaterally increased the size of the Norway pout box or window, i.e., an area east of Scotland where Norway pout catch is restricted to protect juvenile haddock and whiting from being caught incidentally. The impact on Denmark's industrial fisheries was to restrict further access to areas known for good catches of Norway pout. Because virtually all of Denmark's industrial fishing occurs in parts of the North and Baltic Seas that are largely off foreign shores, fishery policies of foreign governments and the European Economic Community (EEC) significantly affect the industry.

In South Africa and Namibia (South West Africa), production and exports of fish meal in 1979 could remain near the levels of recent years. However, there appear to be serious resource problems at least for some of the pelagic species. These problems will likely be resolved sooner in South Africa, which has had a 200-mile fishery management zone with limited, licensed operations by foreign fishing vessels since November 1, 1977. No such zone exists for Namibia, which is administered by South Africa, pending establishment of a fully independent government. Heavy foreign fishing was reported to be continuing off Namibia in 1978. Despite the heavy foreign fishing, the catch quotas for

the domestic pelagic fleet, and the early closure of the domestic pelagic fisheries, the catch of pelagic fish in South Africa and Namibia was 5 percent higher in 1978 than in 1977, in contrast to the pattern of decline in the 1970's. The composition of the pelagic catch and its use significantly changed, causing the production of fish meal and oil to improve more than the pelagic catch figures might suggest. The catch of anchovy and anchovy oil yield improved significantly in 1978; anchovy is used primarily to produce fish meal and oil. On the other hand, the catch of pilchard dropped substantially, affecting the output of canned fishery products and necessitating the importation of canned products to meet domestic demand--traditionally, these products have been exported. In addition, the catch of maasbanker was closer to normal in 1978, well below the unusually high level of 1977. To summarize, resource conditions will probably limit the production of fish meal and oil in South Africa and Namibia in 1979. The improvements in total pelagic catch and in production and exports of fish meal and oil in 1978 do not, upon close examination, suggest a reversal in the apparent worsening situation for some of the pelagic resources. Only the resources off South Africa are fully within the scope of the domestic fishery management authorities.

FISH SOLUBLES

REVIEW: JANUARY-OCTOBER 1978

U.S. production of fish solubles was about 151,000 short tons in the first 10 months of 1978, 35 percent above a year earlier, and 25 percent above the 1972-76 average (table 5). This is the highest production since 1959, when the annual record of 165,000 short tons was set. The output of menhaden solubles was 51 percent above the 1977 level compared with 47 percent above the 1977 level for menhaden meal.

After declining from a high of $177 per short ton in May 1977 to about $125 to $135 in August-November 1977, the price of menhaden solubles moved upward to about $145 in May-June 1978, and then declined to $125 to $135 in July-December.

OUTLOOK

For the same reasons explained in the discussion of fish meal, it is expected that production of fish solubles in 1979 will be far closer to 1972-76 average levels than in 1978. Markets should be strong, unless world supplies of high-protein meal increase more sharply than demand.

Table 5.--U.S. supplies of fish solubles, January-October, 1977 and 1978, and 1972-76 average

Component	1972-76 average	1977	1978
	- - - Thousand short tons- - -		
Production	93.0	83.5	126.4
Menhaden 1/	28.2	28.1	24.8
Unclassified			
Total	121.2	111.6	151.1
Imports 2/	0.2	0.7	3.5
Total new supplies	121.4	112.4	154.7

1/ May include small quantities made from other species.
2/ Data may include fish liver solubles, beginning in 1978.

FISH OIL

REVIEW: JANUARY-OCTOBER 1978

U.S. production of fish oil reached 294 million pounds in January-October 1978 (table 6), near the annual record of 299 million pounds set in 1936. This was more than twice last year's low level and about 39 percent above the 1972-76 average for 10 months. The improvement was attributed to high landings and high oil yield for menhaden.

U.S. exports of fish oil were about 189 million pounds in January-October 1978, more than twice last year's low level, and 10 percent above the 1972-76 average. Exports accounted for 85 percent of the 1972-76 annual average production of fish oil in the United States. The Netherlands is the leading buyer. U.S. domestic use was about 29 million pounds for the first 10 months of 1978, the same as last year, but 4 percent above the 1972-76 average. In the United States, fish oil is used in various inedible products, whereas in Europe it is used mostly in edible products.

The price of menhaden oil fell sharply along with prices of competing oils in mid-1977, and then advanced to 21 cents per pound in March-June 1978. Later, the price fell to slightly below 19 cents, and then moved upward by about 1/2 to 3/4 cent per pound from mid-October to early December 1978. In contrast to late 1977, the monthly average price of menhaden oil in 1978 was for the most part about 1/2 to

Table 6.--U.S supply and use of fish oil, January-October, 1977 and 1978 with 1972-76 average

Component	1972-76 average	1977	1978
	- - - -Million pounds- - - -		
New supplies			
Production			
Menhaden 1/	194.4	113.8	281.8
Anchovy	3.9	3.5	0.3
Tuna-mackerel	5.3	3.3	4.1
Unclassified	8.8	6.3	8.1
Total	212.4	126.9	294.2
Imports 2/	na	10.4	12.9
Total	na	137.2	307.1
Use			
Exports 3/	170.1	82.2	188.9
Consumption 4/	27.8	28.8	28.9
Total	198.0	111.0	217.9

1/ May include small quantities made from other species.
2/ Excludes fish liver oils.
3/ Excludes whale and sperm oil, except for 1978, when the data were no longer reported separately.
4/ Use in inedible products only.
na:Not available.

1 cent per pound (about $11 to $22 per metric ton) lower than the price of fish oil in Europe (fig. 3). Although well below prices of soybean oil in both the United States and Europe, prices of fish oil suggest significant market strength, given the roughly 20-percent increase in exports from nine leading producing-exporting countries in January-September 1978 compared with 1977.

The nine leading producing-exporting countries exported about 390,000 to 400,000 metric tons of fish oil in January-September 1978 (primarily crude oil, excluding hardened and refined oil). Among these countries, Japan was the leading exporter with about 105,000 metric tons in the first 9 months of 1978, up about 60 percent from last year. The United States was second (about 76,000 metric tons, up 123 percent), and Denmark was third with exports estimated to be lower than a year earlier. Norway experienced the largest decline in exports--down about 33 percent to 56,000 metric tons--and thereby lost the position it held in 1977 as the leading exporter. Iceland's exports of fish oil fell 21 percent to 37,000 metric tons. Chile's exports are estimated to be about 50 percent higher than in 1977. South Africa and Namibia (South West Africa) experienced a slightly larger absolute increase than Chile of about 14,000 metric tons (from nil in 1977) for the first 9 months of 1978 (see discussion in outlook for fish meal). Peru's exports of fish oil were nil in both years, because production was probably not high enough to supply domestic needs.

OUTLOOK

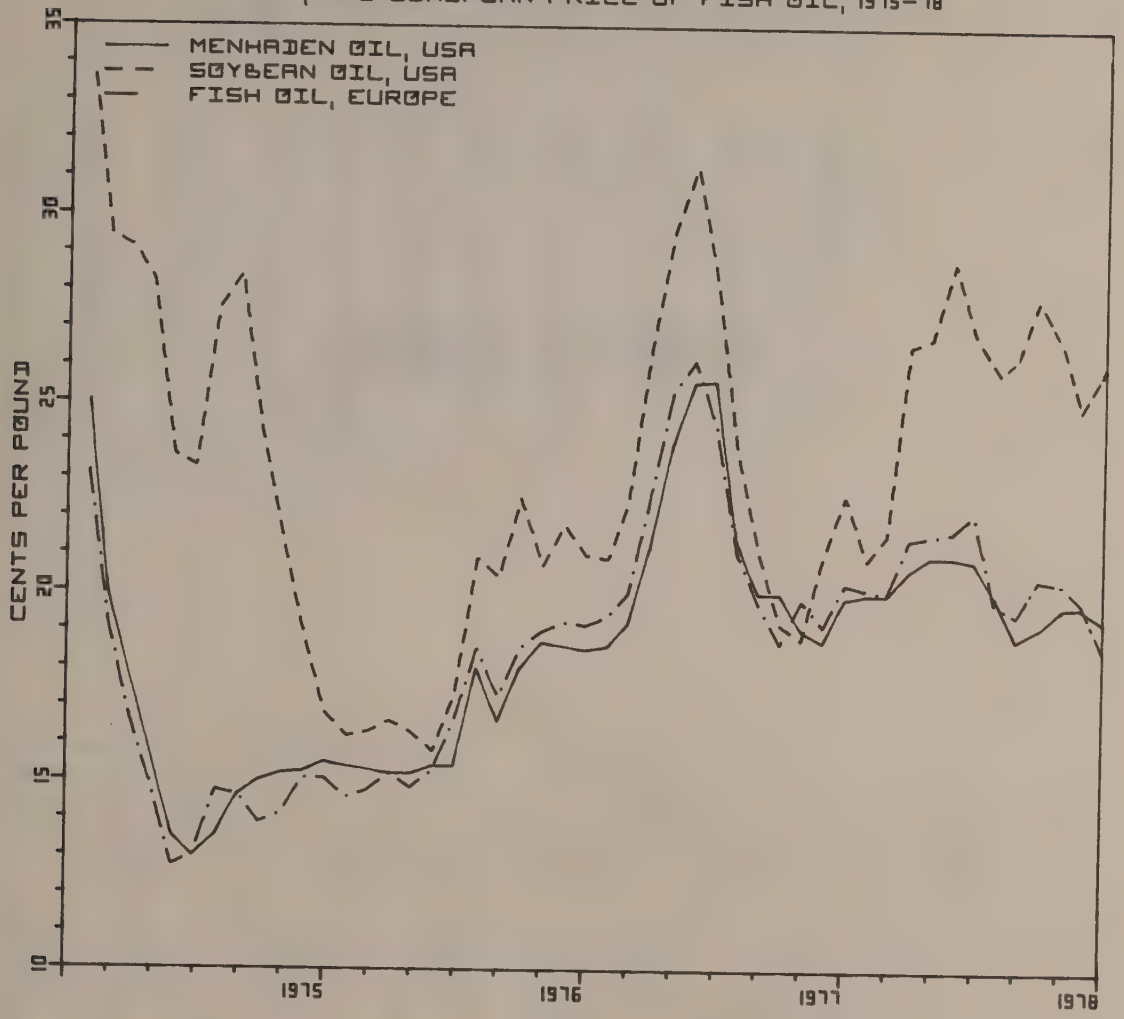
U.S. production of fish oil in 1979 probably will be close to the 1972-76 average level of 220 million pounds (about 100,000 metric tons). A good year for menhaden landings is expected by NMFS biologists, suggesting a good year for menhaden oil. Of course, a low oil yield as in 1977, or a high oil yield as in 1978, would affect fish oil production accordingly, even if menhaden landings were about average in 1979.

U.S. exports of fish oil in 1979 could be about the same as in 1978, 100,000 metric tons, if production reaches this level. This would include exports from 1978 carryover stocks. Because 1978 was a record year or near-record year for production (about 300,000 million pounds or 136,000 metric tons), stocks should be ample at the end of the year. Stocks were relatively low at the beginning of 1978 because of very low production in 1977.

Total exports of fish oil by the nine leading producing-exporting countries are likely to be slightly lower in 1979 than in 1978, perhaps about 400,000 metric tons. Estimates for the individual countries in 1979 are as follows, all in thousands of metric tons: Japan, 120; United States, 100; Denmark, 65; Norway, 50; Iceland, 40; Chile, 30; South Africa and Namibia, nil; and Peru, nil.

Even if world exports of fish oil are lower in 1979 than in 1978, much of what happens to prices of fish oil will depend on the movement of prices of fats and oils in general. Referring just to the 1978/79 crop year, which ends in September 1979, it is estimated that world production of oilseeds, oils, and fats (oil basis) will increase about 5 percent from the previous season, with most of the increase associated with the soybean crops that will be harvested in Argentina and Brazil in the first few months of 1979. If world use of oils and fats experiences a lower rate of increase in the 1978/79 crop year than in the previous year and a lower rate of increase than is estimated for world supplies, conditions may develop that would cause prices to weaken.

Figure 3.--U.S. PRICES OF FISH OIL AND SOYBEAN OIL, AND EUROPEAN PRICE OF FISH OIL, 1975-78



Soybean oil, United States: crude, tank cars, f.o.b. at Decatur, Ill.

Menhaden oil, United States: crude, tank cars, f.o.b. East Coast. plants, quoted at New York City.

Fish oil, N.W. Europe: crude, any origin.

STATISTICAL APPENDIX

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this department.

Table A 1.--Fish meal production, imports, and chick placements, 1959-77 1/

Year	Fish meal production				Imports				Total production plus imports	Chick placements
	Menhaden	Tuna and mackerel	Other species	Total	From Peru	From Canada	From other countries	Total		
	Thousand short tons									Million birds
1959	223.9	25.4	47.5	296.8	49.9	39.0	44.0	132.9	429.7	1,632.7
1960	218.4	26.5	36.5	281.4	68.2	31.0	32.4	131.6	413.0	1,738.3
1961	247.6	21.2	31.7	300.5	151.4	38.2	28.2	217.8	518.3	1,916.5
1962	239.7	26.6	34.7	301.0	186.2	42.8	23.2	252.3	553.3	1,993.9
1963	182.4	27.0	36.8	248.0	285.4	51.0	39.9	376.3	624.3	2,054.4
1964	160.4	21.1	43.6	225.1	348.0	54.8	36.3	439.1	664.2	2,149.6
1965	176.0	25.4	41.1	242.3	209.8	43.8	17.0	270.7	513.0	2,368.8
1966	135.0	25.3	52.1	212.4	276.6	43.6	127.5	447.8	660.2	2,594.4
1967	119.1	25.5	56.8	201.4	442.5	46.6	162.3	651.5	852.9	2,594.8
1968	143.2	28.8	55.0	227.0	635.9	65.1	154.2	855.3	1,082.3	2,621.7
1969	159.5	26.9	57.8	244.1	218.1	67.8	72.4	358.4	602.5	2,847.1
1970	188.6	26.7	41.8	257.0	153.2	75.4	22.8	251.5	508.5	3,000.9
1971	221.0	29.3	32.6	282.9	199.6	57.6	26.0	283.2	566.1	2,982.2
1972	193.6	43.2	37.3	274.1	352.2	27.6	12.1	392.0	666.1	3,110.2
1973	188.8	43.6	46.7	279.1	41.8	24.6	2.2	68.5	347.5	3,029.4
1974	203.9	48.2	39.5	291.7	29.4	30.3	8.6	68.3	359.9	2,935.9
1975	191.4	37.2	50.5	279.2	75.5	34.0	8.9	118.4	397.6	2,998.7
1976	212.6	40.1	46.4	299.0	79.4	34.0	27.0	140.4	439.4	3,306.5
1977	193.3	39.2	40.5	273.0	15.6	24.8	41.1	81.5	354.5	3,456.1

1/ Excludes meal made from shellfish.

Note: Figures may not add to total because of rounding.

Table A 2.--Supplies of fish meal in the United States by month, 1972-76 average and 1977-78

Time period	Production				Imports				Total new supplies				Exports			Total		
	1972-76 average	1976	1977	1978	1972-76 average	1976	1977	1978	1972-76 average	1976	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978
	Thousand short tons																	
January	5.6	6.5	5.0	5.9	6.5	4.1	10.3	3.1	12.1	10.6	15.3	9.0	3.1	0.5	0.8	9.0	14.8	8.2
February	4.6	4.0	4.1	5.0	10.8	2.5	8.9	1.5	15.4	6.5	13.0	6.5	2.9	0.1	1.8	12.5	12.9	4.7
March	5.7	6.1	7.5	5.6	11.4	8.0	3.4	1.3	17.1	14.1	11.0	6.9	1.1	0.4	3.7	16.1	10.6	3.2
1st quarter	15.9	16.6	16.7	16.5	28.7	14.6	22.6	5.9	44.6	31.2	39.3	22.4	7.0	1.0	6.3	37.6	38.3	16.1
April	13.5	17.6	15.1	19.9	11.1	6.0	9.8	3.0	24.6	23.6	24.9	22.9	2.1	0.3	3.9	22.6	24.6	19.0
May	30.7	25.0	23.9	34.7	17.6	21.8	9.7	3.5	48.3	46.8	33.6	38.2	0.7	2.6	1.2	47.6	31.0	37.0
June	43.0	42.1	46.7	64.8	15.2	14.6	11.7	2.4	58.2	56.7	58.4	67.3	1.6	0.3	5.7	56.6	58.1	61.6
2d quarter	87.2	84.7	85.7	119.4	43.9	42.4	31.2	9.0	131.1	127.0	116.8	128.4	4.3	3.2	10.8	126.8	113.7	117.6
July	54.0	55.7	46.3	58.2	22.3	13.1	6.9	5.3	76.3	68.9	53.2	63.5	2.3	2.7	6.1	74.0	50.5	57.4
August	49.2	54.1	39.9	57.8	13.6	12.6	7.7	5.6	62.8	66.7	47.6	63.4	2.6	5.2	8.8	60.2	42.5	54.6
September	32.9	41.8	38.3	46.5	17.0	26.3	4.0	3.4	49.9	68.1	42.4	50.0	3.5	6.7	7.5	46.4	35.7	42.4
3d quarter	136.1	151.7	124.6	162.5	52.9	51.9	18.6	14.3	189.0	203.6	143.2	176.8	8.4	14.6	22.5	180.6	128.6	154.3
October	20.3	18.6	21.0	30.6	17.7	15.8	2.8	3.2	38.0	34.4	23.8	33.8	3.1	11.8	6.6	34.9	12.1	27.2
November	14.1	14.9	11.7	9.8	11.1	10.8	2.2	2.8	25.2	25.6	14.0	12.7	2.0	0.7	3.1	23.1	13.3	9.5
December	11.0	12.6	13.4		3.3	4.8	4.1		14.3	17.4	17.4		4.6	5.0		9.6	12.5	
4th quarter	45.4	46.1	46.1		32.0	31.4	9.1		77.4	77.5	55.2		9.8	17.4		67.6	37.8	
Total	284.5	299.0	273.0		157.5	140.4	81.5		442.1	439.4	354.5		29.5	36.1		412.6	318.4	

Note: Production excludes meal from shellfish. 1978 figures are preliminary.
Figures may not add to total because of rounding.

Source: NMFS, Resource Statistics Division; Bureau of the Census.

Table A 3.--U.S. fish meal production by species, by month, 1972-76 average, and 1977-78

Time period	Anchovy			Menhaden			Tuna and mackerel			Unclassified			Total		
	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978
	Thousand short tons														
January	1.9	0.4	1/	0.1	1.0	2.0	2.6	2.5	2.7	1.1	1.1	1.2	5.6	5.0	5.9
February	1.2	0.4	-	-	-	-	2.4	2.6	2.9	1.0	1.2	2.1	4.6	4.1	5.0
March	0.6	2.0	1/	-	-	-	3.7	3.8	3.8	1.4	1.7	1.8	5.7	7.5	5.6
1st quarter	3.7	2.8	1/	0.1	1.0	2.0	8.7	8.9	9.4	3.4	4.0	5.1	15.9	16.7	16.5
April	2.7	3.0	-	5.1	7.3	14.7	4.0	3.2	3.8	1.7	1.6	1.4	13.5	15.1	19.9
May	1.4	2/	1/	23.4	19.8	28.9	3.5	2.5	4.0	2.3	1.6	1.8	30.7	23.9	34.7
June	-	-	-	36.1	41.4	59.3	3.9	2.5	3.7	3.1	2.7	1.8	43.0	46.7	64.8
2d quarter	4.1	3.0	1/	64.6	68.5	103.0	11.4	8.2	11.6	7.1	6.0	5.0	87.2	85.7	119.5
July	-	-	-	46.9	39.4	51.8	3.7	4.0	4.2	3.4	3.0	2.3	54.0	46.3	58.2
August	0.1	3/	1/	41.4	33.8	50.2	4.0	3.8	4.7	3.7	2.3	2.9	49.2	39.9	57.8
September	1.3	1.0	0.5	25.1	31.2	38.7	3.6	3.4	5.0	2.9	2.7	2.4	32.9	38.3	46.5
3d quarter	1.4	1.0	0.5	113.4	104.4	140.6	11.4	11.2	13.9	9.9	7.9	7.5	136.1	124.6	162.5
October	2.9	5.1	1/	11.6	10.1	23.6	3.8	4.0	4.2	2.1	1.8	2.8	20.3	21.0	30.6
November	3.6	4.3	0.9	5.8	3.1	2.4	3.6	3.4	5.3	1.1	0.9	1.2	14.1	11.7	9.8
December	3.7	2.7		2.7	6.0		3.6	3.5		1.0	1.1		11.0	13.4	
4th quarter	10.2	12.1		20.0	19.3		11.0	10.9		4.2	3.8		45.4	46.1	
Total	19.4	18.9		198.0	193.3		42.5	39.2		24.7	21.7		284.6	273.0	

1/ Included with unclassified.
2/ Included with April.
3/ Included with September.

Note: Production excludes meal from shellfish.
Figures may not add to total because of rounding. 1978 figures are preliminary.

Source: NMFS, Resource Statistics Division.

Table A 4.--U.S. imports of fish meal by country of origin, by month, 1972-76 average, and 1977-78

Time period	Canada			Chile 1/	Norway			Peru			Other countries 2/			Total		
	1972-76 average	1977	1978	1972-76 average	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978
	Thousand short tons															
January	1.6	1.3	1.1	-	0.5	-	-	4.3	7.9	-	0.1	1.1	1.9	6.5	10.3	3.1
February	1.1	1.1	1.4	-	0.8	-	-	8.9	7.7	-	0.1	3/	0.1	10.8	8.9	1.5
March	1.4	2.0	1.3	-	0.7	-	-	8.8	-	-	0.4	1.4	-	11.4	3.4	1.3
1st quarter	4.1	4.5	3.9	-	2.0	-	-	21.9	15.6	-	0.7	2.6	2.0	28.7	22.6	5.9
April	2.3	2.1	2.9	1.0	1.2	5.2	-	6.5	-	-	0.1	2.5	0.1	11.1	9.8	3.0
May	2.3	1.9	3.5	-	0.9	4.9	-	14.3	-	-	0.1	2.9	-	17.6	9.7	3.5
June	2.5	1.7	2.4	-	0.5	7.7	-	12.2	-	-	3/	2.3	-	15.2	11.7	2.4
2d quarter	7.0	5.7	8.9	1.0	2.7	17.8	-	33.0	-	-	0.2	7.7	0.1	43.9	31.2	9.0
July	3.4	2.1	4.0	-	-	3.6	-	18.1	-	-	0.8	1.1	1.2	22.3	6.9	5.3
August	4.0	3.2	4.4	-	-	2.2	-	9.2	-	-	0.5	2.3	1.2	13.6	7.7	5.6
September	3.9	2.8	3.4	-	0.7	-	-	12.0	-	-	0.5	1.3	3/	17.0	4.0	3.4
3d quarter	11.3	8.1	11.9	-	0.7	5.8	-	39.2	-	-	1.8	4.7	2.5	52.9	18.6	14.3
October	4.0	2.8	3.2	-	0.8	-	-	12.3	-	-	0.6	-	-	17.7	2.8	3.2
November	2.1	2.2	2.8	0.5	-	-	-	8.5	-	-	3/	0.1	-	11.1	2.2	2.8
December	1.6	1.6		0.1	0.7	-		0.7	-		0.2	2.5		3.3	4.1	
4th quarter	7.7	6.6		0.6	1.4	-		21.5	-		0.8	2.6		32.0	9.1	
Total	30.1	24.8		1.5	6.7	23.6		115.6	15.6		3.5	17.5		157.5	81.5	

1/ Imports from Chile in 1976-78 were nil, except in May 1977, when about 2,200 tons were received.
2/ Includes Chile, except in the 1972-76 average.
3/ Less than 50 short tons.

Note: Figures may not add to total because of rounding.

Source: Bureau of the Census.

Table A 5 .--U.S. fish meal exports, annual, by country of destination, 1972-78

Country of destination	1972	1973	1974	1975	1976	1977	1978 Jan.-June	1978 Jan.-Oct.
				Short tons				
Canada	78	2,685	2,163	3,050	1,817	2,076	89	369
Dominican Republic	579	396	690	1,309	412	-	504	894
Guatemala	206	160	-	-	-	-	-	-
Mexico	4,759	1,264	8,533	-	-	1,064	163	321
Belgium	-	865	-	-	-	-	-	-
Germany, West	2,407	21,886	33,006	3,066	17,217	22,832	6,577	28,643
Italy	-	-	275	-	-	-	113	113
Netherlands	270	189	-	-	-	-	-	-
Spain	764	488	466	-	-	-	-	-
United Kingdom	409	1,689	542	-	-	-	-	-
Yugoslavia	-	-	275	-	-	-	-	-
Iran	-	4,297	1,905	-	292	220	2,122	2,122
Lebanon	-	-	-	-	-	210	-	-
Saudi Arabia	-	-	-	-	-	154	415	1,075
Syria	-	-	-	-	661	-	-	-
Taiwan	-	-	-	-	-	1,781	94	94
Egypt	-	928	6,063	3,274	11,530	6,120	6,224	11,349
Ghana	660	1,542	506	847	782	711	300	600
Libya	-	-	866	-	-	-	-	-
Zaire	-	181	-	-	-	-	-	-
Australia	-	17	-	-	-	-	279	279
Other countries	219	145	225	237	430	935	246	354
Total	10,351	36,732	55,515	11,783	33,141	36,103	17,126	46,213

Source: Bureau of the Census.

Table A 6.--Broiler chicks placed in 21 States, and average broiler price at the farm by month, 1972-76 average, and 1976-78

Time period	Chicks placed				Percentage change in chicks placed			Broiler price at the farm		
	1972-76 average	1976	1977	1978	in 1976 from 1972-76 average	in 1977 from 1976	in 1978 from 1977	1976	1977	1978
	Million				Percent			Cents/lb		
January	289.1	300.7	316.1	337.0	+ 4.0	+ 5.1	+ 6.6	24.2	21.9	22.8
February	238.8	246.8	259.1	275.9	+ 3.4	+ 5.0	+ 6.5	25.2	24.3	24.3
March	250.9	264.4	276.7	285.5	+ 5.4	+ 4.6	+ 3.2	24.4	24.2	24.8
1st quarter	778.8	811.9	851.8	898.5	+ 4.3	+ 4.9	+ 5.5	24.6	23.5	24.0
April	255.3	272.8	285.0	296.0	+ 6.9	+ 4.5	+ 3.9	23.5	24.2	28.1
May	319.4	341.5	359.8	382.6	+ 6.9	+ 5.4	+ 6.4	24.6	24.1	27.2
June	253.3	275.1	285.8	308.1	+ 8.6	+ 3.9	+ 7.8	24.3	24.9	30.2
2d quarter	828.1	889.4	930.7	986.7	+ 7.4	+ 4.6	+ 6.0	24.1	24.4	28.5
July	298.9	329.2	338.7	368.3	+ 10.1	+ 2.9	+ 8.7	25.4	25.9	32.8
August	238.3	256.5	254.6	274.9	+ 7.6	- 0.7	+ 8.0	23.8	24.1	26.7
September	221.3	249.2	255.6	269.8	+ 12.6	+ 2.6	+ 5.5	22.8	23.8	26.7
3d quarter	758.6	834.8	848.9	913.1	+ 10.1	+ 1.7	+ 7.6	24.0	24.6	28.7
October	262.0	286.7	310.4	330.7	+ 9.4	+ 8.3	+ 6.5	20.6	22.7	24.8
November	224.1	238.3	249.2	270.2	+ 6.3	+ 4.5	+ 8.4	19.4	21.3	24.7
December	231.5	245.3	265.2	289.5	+ 5.9	+ 8.1	+ 9.2	19.7	20.2	24.9
4th quarter	717.6	770.3	824.7	890.5	+ 7.3	+ 7.1	+ 8.0	19.9	21.4	24.8
Total	3,083.0	3,306.5	3,456.1	3,688.7	+ 7.2	+ 4.5	+ 6.7	23.2	23.5	26.5

Note: Figures may not add to total because of rounding. 1977 and 1978 figures are preliminary.

Sources: Delmarva Broiler Chick Report, U.S. Department of Agriculture, Statistical Reporting Service, and Poultry and Egg Situation, U.S. Department of Agriculture, Economic Research Service.

Table A.7 --Supply and utilization of fish meal in major exporting countries, January-September 1977 and 1978

Country and period	Beginning inventory	Production	Subtotal	Exports	Domestic consumption	Ending inventory
			Metric tons			
1977						
FEO countries 1/						
Chile	36,352	175,157	211,509	119,352	8,763	83,904
Iceland	3,665	142,385	146,050	113,264	3,600	29,085
Norway	139,358	384,276	523,634	323,492	17,853	182,289
Peru	148,033	301,398	449,431	307,576	88,894	52,961
South Africa	1,908	171,400	173,308	9,165	124,627	39,516
FEO total	329,316	1,174,616	1,503,932	872,849	243,737	387,755
Other countries						
Canada	3,589	34,436	38,025	18,689	14,289	5,454
Denmark	7,000	253,000	260,000	214,400	38,600	14,000
Grand total	339,905	1,462,052	1,801,957	1,105,938	296,626	407,209
1978						
FEO countries 1/						
Chile	45,790	277,384	323,174	163,336	7,860	153,188
Iceland	19,118	148,721	167,839	141,086	3,600	23,153
Norway	128,409	260,996	389,405	215,497	22,129	151,779
Peru	89,679	355,350	445,029	307,883	53,260	83,886
South Africa	7,273	182,000	189,273	1,000	106,527	81,746
FEO total	290,269	1,224,451	1,514,720	828,802	193,376	493,752
Other countries						
Canada	4,427	45,766	50,193	27,059	17,246	6,209
Denmark	na	na	na	208,500	na	na
Grand total	na	na	na	1,064,361	na	na

Table A 8.--Supply and utilization of fish meal in major exporting countries, January-December 1976 and 1977

Country and period	Beginning inventory	Production	Subtotal	Exports	Domestic consumption	Ending inventory
			Metric tons			
1976						
FEO countries 1/						
Chile	27,041	218,298	245,339	198,099	9,928	36,352
Iceland	1,802	109,111	110,913	102,448	4,800	3,665
Norway	114,246	464,062	578,308	417,744	21,206	139,358
Peru	40,136	836,736	876,872	593,084	135,479	148,033
South Africa	1,780	208,273	210,053	43,145	166,000	1,908
FEO total	185,005	1,836,480	2,021,485	1,354,520	337,413	329,316
Other countries						
Canada	5,388	50,776	56,164	31,964	21,573	3,589
Denmark	15,000	325,000	340,000	284,600	48,400	7,000
Grand total	205,393	2,212,256	2,417,649	1,671,084	407,386	339,905
1977						
FEO countries 1/						
Chile	36,352	220,628	256,980	198,630	13,048	45,790
Iceland	3,665	169,558	173,223	149,204	4,800	19,118
Norway	139,358	464,799	604,157	450,310	25,438	128,409
Peru	148,033	492,700	640,733	436,000	116,400	89,679
South Africa	1,908	171,400	173,308	9,165	156,870	7,273
FEO total	329,316	1,519,085	1,848,401	1,243,309	316,556	290,269
Other countries						
Canada	3,589	44,531	48,120	27,626	16,531	4,427
Denmark	7,000	310,000	317,000	263,800	na	na
Grand total	339,905	1,873,616	2,213,521	1,534,735	na	na

1/ Excluding Angola, for which figures are not available.
na: Not available.

Source: Fishmeal Exporters Organization (FEO), Paris; Oil World Weekly, published by ISTA Mielke & Co., Hamburg; Canada, Fisheries and Marine Service, Ottawa; and other sources.

Note: Figures are preliminary, and may include slight discrepancies, owing to revisions, to differences in definition or reporting practices among sources and countries, and to other possible reasons. Figures for Denmark are partially estimated.

Table A 9.--FEO exports of fish meal by country of destination, January-September 1977-78

Country of destination	Exports		Percentage of total FEO exports		Percentage change from 1977 to 1978
	1977	1978	1977	1978	
	-Thousand metric tons-		-Percent-		
France	38.1	29.1	4.4	3.5	- 23.6
Germany, West	122.5	127.6	14.0	15.4	+ 4.2
Holland/Belgium	35.8	28.3	4.1	3.4	- 20.9
Italy	27.3	27.6	3.1	3.3	+ 1.1
United Kingdom	57.8	53.1	6.6	6.4	- 8.1
Scandinavian countries	80.6	86.7	9.2	10.5	+ 7.6
East European countries	243.2	270.4	27.9	32.6	+ 11.2
U.S.S.R.	14.2	-	1.6	-	- 100.0
United States 1/	13.0	-	1.5	-	- 100.0
Cuba	19.4	31.8	2.2	3.8	+ 63.9
Latin American countries 2/	6.6	17.6	0.8	2.1	+ 166.7
China, P.R.	-	12.5	-	1.5	-
Iran	20.7	43.4	2.4	5.2	+ 109.7
Israel	16.0	5.6	1.8	0.7	- 65.0
Japan	114.4	29.2	13.1	3.5	- 74.5
Taiwan	18.3	28.0	2.1	3.4	+ 53.0
Others	44.85	37.8	5.9	4.6	- 15.7
Total	872.75	828.8	100.0	100.0	- 5.0

Table A10.--FEO exports of fish meal by country of destination, January-December 1976-77

Country of destination	Exports		Percentage of total FEO exports		Percentage change from 1976 to 1977
	1976	1977	1976	1977	
	-Thousand metric tons-		-Percent-		
France	47.6	51.5	3.5	4.5	+ 8.2
Germany, West	248.9	175.5	18.4	15.4	- 29.5
Holland/Belgium	38.9	43.5	2.9	3.8	+ 11.8
Italy	64.6	39.0	4.8	3.4	- 39.6
Portugal	6.0	10.0	0.4	0.9	+ 66.7
Switzerland	7.3	10.0	0.5	0.9	+ 37.0
U.K./Eire	99.7	87.0	7.4	7.6	- 12.7
Scandinavian countries 1/	103.6	100.0	7.6	8.8	- 3.5
East European countries	371.8	295.0	27.5	25.9	- 20.7
U.S.S.R.	7.0	14.0	0.5	1.2	+ 100.0
United States 2/	90.6	33.0	6.7	2.9	- 63.6
Cuba	29.0	21.0	2.1	1.8	- 27.6
Latin American countries 3/	25.9	9.64	1.9	0.8	- 62.8
China, P.R.	34.8	5.0	2.6	0.4	- 85.6
Iran	34.2	22.8	2.5	2.0	- 33.3
Israel	5.8	17.6	0.4	1.5	+ 203.4
Japan	43.8	142.0	3.2	12.4	+ 224.2
Philippines	16.2	8.0	1.2	0.7	- 50.6
Taiwan	12.5	24.4	0.9	2.1	+ 95.2
Others	66.2	32.126	4.9	2.8	- 51.5
Total	1,354.4	1,141.066	100.0	100.0	- 15.8

1/ Does not include Denmark.
2/ Based on export figures reported by FEO countries.
3/ Includes Haiti; does not include Cuba.

Note: Recipient countries and categories are those given by FEO.

Source: Fishmeal Exporters Organization (FEO).

Table A 11--Selected average monthly wholesale prices and price ratio of fish meal to soybean meal, 1977-78

Period	Menhaden 1/	Tuna-mix 2/	Imported Peruvian 3/	Northwest Europe 4/	Japan 5/	Soybean 6/		Peruvian fish meal to 50% protein soybean meal
						44% protein	50% protein	
	-Dollars per short ton-							-Price ratio-
1977								
January	412.50	323.13	404.50	423.43	413.94	207.00	224.25	1.80
February	423.75	357.50	416.67	410.05	413.18	211.00	230.38	1.81
March	433.33	364.38	7/431.25	401.16	443.00	226.20	246.60	1.80
April	7/ 483.13	367.82	7/479.38	438.86	477.33	275.63	299.00	1.60
May	486.00	390.50	482.50	458.81	471.16	258.25	283.50	1.70
June	423.75	405.97	435.00	433.09	481.70	225.30	247.10	1.76
July	327.50	275.00	358.75	405.29	480.17	162.00	182.75	1.96
August	318.75	247.50	325.00	346.77	473.16	140.30	160.90	2.02
September	332.50	244.06	335.00	369.95	479.01	143.65	162.40	2.06
October	349.00	304.13	345.00	414.13	507.63	135.00	150.75	2.29
November	363.13	275.00	358.33	419.12	520.62	161.70	177.90	2.01
December	366.25	288.75	365.00	420.58	476.29	160.13	175.13	2.08
Average	393.30	320.31	394.70	411.77	469.77	192.18	211.72	1.86
1978								
January	8/ 364.50	9/	366.00	409.82	447.81	162.20	175.40	2.09
February	8/ 363.33	9/	366.67	393.95	428.77	152.88	166.38	2.20
March	370.63	330.00	385.00	393.54	485.56	179.38	193.38	1.99
April	383.33	316.25	400.00	377.62	477.45	173.00	188.75	2.12
May	363.50	302.50	7/377.50	372.40	464.08	177.40	194.90	1.94
June	351.25	9/	9/	370.50	468.07	169.75	187.13	10/ 1.88
July	318.50	310.75	9/	363.33	464.35	172.00	187.25	10/ 1.70
August	331.25	302.50	9/	367.78	428.46	162.90	178.20	10/ 1.86
September	355.00	288.75	9/	351.08	422.68	163.88	178.25	10/ 1.99
October	370.50	288.75	371.25	347.91		176.80	191.70	1.94
November	383.75	288.75	9/	361.43		177.13	189.50	10/ 2.03
December	378.75	292.19	391.67	353.50		188.75	204.50	1.92

1/ 60 percent protein, bulk, quoted by brokers at New York City, f.o.b. East Coast and Gulf plants.
2/ 55 percent protein, bulk, Los Angeles.
3/ 65 percent protein, bulk f.o.b., East Coast and Gulf ports.
4/ 65 percent protein, any origin, c & f Hamburg, West Germany.
5/ The average unit value of imports into Japan of fish meal and flour, c.i.f., excluding any duties on imports in excess of quotas, converted at the average monthly currency exchange rates.
6/ Bulk at Decatur, Ill.
7/ Nominal price.
8/ Asking price.
9/ No quotes.
10/ Ratio of menhaden meal price to 50 percent protein soybean meal price.

Source: For prices of fish meal in the United States: NMFS, Resource Statistics Division. For Hamburg prices: Oil World, ISTA Mielke & Co., Hamburg, West Germany. For soybean meal prices: Feed Market News, U.S. Department of Agriculture, Consumer and Marketing Service, Grain Division. For Japanese prices: Japan Tariff Association, Japan Exports and Imports; IMF, International Financial Statistics.

Table A12.--Fish solubles production, imports, and menhaden solubles prices January-December, 1953-77

Year	Production			Imports	Total supplies	Price		Menhaden meal to menhaden solubles
	Menhaden	Other	Total			Actual 1/	In 1972 2/ dollars	
	Thousand short tons					Dollars per short ton		Price ratio
1953	39.5	42.5	81.5	-	81.5	107.50	182.57	1.24
1954	56.3	58.8	115.0	3.6	118.6	98.96	165.79	1.37
1955	61.9	49.0	110.9	3.3	114.2	75.00	122.99	1.81
1956	72.9	56.0	128.8	3.0	131.8	76.23	121.19	1.76
1957	69.4	52.9	122.3	9.7	132.0	93.23	143.39	1.39
1958	72.5	57.7	130.2	14.6	144.8	97.51	147.61	1.41
1959	108.1	57.3	165.4	26.6	192.0	67.62	100.51	1.89
1960	65.8	33.1	98.9	3.2	102.1	37.74	54.96	2.46
1961	73.3	38.9	112.2	6.7	119.0	47.25	68.20	2.48
1962	85.2	39.4	124.6	6.3	130.9	55.06	78.04	2.25
1963	74.8	32.6	107.4	7.1	114.5	63.08	88.11	1.99
1964	68.7	24.6	93.3	4.5	97.8	61.98	85.24	2.12
1965	73.2	21.7	94.8	5.1	100.0	58.28	78.42	2.89
1966	60.8	22.7	83.4	4.3	87.7	70.74	92.16	2.28
1967	51.8	22.9	74.7	3.7	78.3	63.24	80.03	2.16
1968	53.2	18.6	71.8	1.8	73.6	52.93	64.10	2.74
1969	63.3	18.4	81.7	0.2	81.8	49.60	57.20	3.51
1970	71.9	23.1	95.0	.5	95.4	51.88	56.79	3.56
1971	91.5	19.7	111.2	.1	111.2	47.30	49.26	3.33
1972	104.1	30.3	134.4	.1	134.5	43.45	43.45	4.27
1973	104.4	33.1	137.4	.3	137.7	134.62	127.24	3.51
1974	102.9	34.3	137.3	-	137.3	89.78	77.38	3.07
1975	83.6	44.2	127.8	.1	127.9	66.27	52.11	3.61
1976	95.3	37.8	133.1	1.2	134.3	124.57	93.05	2.78
1977	87.4	34.9	122.3	.8	123.2	148.55	105.12	2.51

1/ Average weighted by monthly production (between 1953 and 1958 simple average is quoted).
2/ Weighted average price divided by implicit price deflator for GNP (1972=100).

Note: Figures may not add to total because of rounding.

TABLE A13.--PRODUCTION AND AVERAGE PRICE OF FISH SOLUBLES, BY MONTH, 1972-76 AVERAGE AND 1976-78

	PRODUCTION				PRICE (1)			MENHADEN SOLUBLES TO MENHADEN MEAL		
	1972-76 AVERAGE	1976	1977	1978	1976	1977	1978	1976	1977	1978
	THOUSAND SHORT TONS				DOLLARS PER SHORT TON			PRICE RATIO		
JANUARY	2.2	3.1	1.2	3.1	(2) 75.00	(2)140.00	(2)135.50	0.28	0.34	0.37
FEBRUARY	1.5	1.4	1.7	1.7	(2) 75.00	(2)144.38	(2)137.50	0.28	0.34	0.38
MARCH	2.7	3.5	3.6	1.9	80.62	(2)147.50	(2)137.50	0.29	0.34	0.37
1ST QTR	6.4	8.0	6.5	6.7	76.87	143.96	136.83	0.28	0.34	0.37
APRIL	6.6	8.4	8.9	8.2	79.38	(2)166.88	(2)142.50	0.31	0.35	0.37
MAY	13.7	10.1	10.7	12.8	93.75	(2)177.00	145.50	0.33	0.36	0.40
JUNE	20.2	17.1	18.2	24.8	118.50	(2)176.25	145.00	0.34	0.42	0.41
2ND QTR	40.5	35.6	37.8	45.7	97.21	173.38	144.33	0.33	0.38	0.39
JULY	24.4	25.4	18.6	26.0	138.75	(2)149.38	129.50	0.36	0.46	0.41
AUGUST	23.4	22.2	18.3	32.4	(2)128.00	(2)128.50	126.25	0.40	0.40	0.38
SEPTEMBER	15.2	18.5	19.2	26.1	(2)127.50	(2)131.25	131.25	0.35	0.39	0.37
3RD QTR	63.0	66.1	56.2	84.5	131.42	136.38	129.00	0.37	0.42	0.39
OCTOBER	11.3	9.0	11.1	13.5	(2)127.50	(2)126.00	132.50	0.35	0.36	0.36
NOVEMBER	7.9	9.9	6.1	10.7	(2)129.00	(2)127.50	131.25	0.35	0.35	0.34
DECEMBER	4.9	4.5	4.6		(2)135.00	(2)133.75	126.25	0.34	0.37	0.33
4TH QTR	24.1	23.4	21.8		131.17	129.08	130.00	0.35	0.36	0.34
TOTAL	134.0	133.1	122.3		109.17	145.70	135.04	0.33	0.37	0.37

(1) MENHADEN SOLUBLES IN TANK CARS; PRICE QUOTED BY BROKERS AT NEW YORK CITY, F.O.B. EAST COAST PLANTS.
(2) NOMINAL PRICE.

NOTE: FIGURES MAY NOT SUM TO TOTAL BECAUSE OF ROUNDING. 1977 AND 1978 FIGURES SUBJECT TO REVISION.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION.

Table A14.--Fish oil production, imports, exports, domestic use, and apparent stock changes, 1950-77

Year	U.S. production 1/					Imports 2/	Total supplies 3/	Exports 4/	U.S. industrial utilization 2/	Net changes in stocks
	Menhaden	Tuna and mackerel	Herring	Other	Total					
	Million pounds									
1950	76.6	6.6	24.8	52.7	160.7	15.1	175.9	76.0	5/	5/
1951	94.0	5.3	11.3	22.9	133.5	17.4	150.9	49.8	5/	5/
1952	96.7	5.6	8.1	8.2	118.6	15.6	134.2	44.0	5/	5/
1953	133.7	4.9	5.4	6.7	150.7	12.0	162.6	108.5	5/	5/
1954	139.8	4.4	5.7	12.3	162.2	13.0	175.2	141.6	5/	5/
1955	159.2	4.1	8.2	13.6	185.1	10.4	195.5	142.7	74.9	- 22.1
1956	168.2	5.3	13.7	10.1	197.3	10.7	207.9	140.9	81.3	- 14.2
1957	118.5	5.5	14.1	10.1	148.2	7.2	155.4	114.9	83.0	- 42.5
1958	128.0	4.7	13.2	15.7	161.6	4.9	166.6	94.0	67.5	+ 5.1
1959	154.7	4.5	15.0	9.0	183.2	6.8	189.9	144.5	58.6	- 13.2
1960	183.4	3.8	11.5	6.9	205.6	8.9	214.6	143.7	56.8	+ 14.1
1961	235.2	5.7	6.1	7.6	254.6	8.4	263.0	122.5	64.8	+ 75.7
1962	232.6	5.0	5.1	4.8	247.5	10.8	258.2	123.0	62.9	+ 72.3
1963	167.6	5.9	5.7	4.5	183.7	8.6	192.2	262.3	52.1	- 122.2
1964	157.7	4.8	10.3	4.2	177.0	11.8	188.8	151.5	47.7	- 10.4
1965	175.2	4.8	8.5	4.3	192.8	6.0	198.7	103.8	44.5	+ 50.4
1966	144.2	4.1	7.9	6.5	162.7	12.7	175.3	77.3	38.8	+ 59.2
1967	101.4	5.2	5.7	7.6	119.9	7.0	126.9	76.8	35.8	+ 14.3
1968	152.0	4.5	9.5	5.7	171.7	5.9	177.6	65.1	30.0	+ 82.5
1969	149.2	4.2	3.5	11.1	168.0	4.2	172.2	196.1	34.1	- 58.0
1970	186.3	3.5	5.4	10.9	206.1	5.5	211.6	158.8	31.4	+ 21.4
1971	244.0	4.9	5.9	10.2	265.0	7.5	272.5	229.9	26.5	+ 16.1
1972	167.0	5.0	5.1	11.3	188.4	9.4	197.9	193.2	29.8	- 34.5
1973	200.5	7.4	1.7	15.0	224.6	6.7	231.4	247.8	26.5	- 42.9
1974	217.0	5.8	6/	14.1	238.0	12.4	250.3	199.1	35.0	+ 16.2
1975	213.3	6.4	6/	25.9	245.7	11.3	256.9	191.8	36.8	+ 28.3
1976	186.4	6.3	6/	11.8	204.6	20.9	225.5	179.2	38.4	+ 7.8
1977	116.1	3.8	5/	13.2	133.2	13.7	146.9	90.6	35.4	+ 20.8

1/ Excludes whale and sperm oils.
2/ Excludes liver, whale and sperm oils.
3/ Production plus imports.
4/ Does not include exports of foreign merchandise.
5/ Not available.
6/ Included with other.

Note: Figures may not add to total because of rounding.

Table A15.--U.S. production of fish oil, by month, 1972-76 average, and 1976-78

Time period	Anchovy			Menhaden			Tuna and mackerel			Other			Total			
	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1977	1978	1972-76 average	1976	1977	1978
	Million pounds															
January	0.6	0.1	4/	1/	0.1	0.1	0.3	0.3	0.3	0.2	0.1	0.2	1.2	1.6	0.6	0.6
February	0.2	2/	-	-	-	-	0.3	0.3	0.3	0.2	0.3	0.3	0.7	0.7	0.6	0.6
March	0.1	2/	4/	-	-	-	0.5	0.3	0.2	0.2	0.3	0.4	0.8	0.9	0.6	0.6
1st quarter	1.0	0.1	4/	1/	0.1	0.1	1.1	0.9	0.8	0.6	0.7	1.0	2.7	3.2	1.8	1.8
April	0.3	0.1	-	4.7	4.4	16.1	0.5	0.4	0.3	0.3	0.3	0.2	5.9	9.0	5.2	16.6
May	0.2	2/	-	26.0	13.4	29.4	0.5	0.1	0.5	0.8	0.3	0.8	27.4	18.7	13.9	30.6
June	-	-	-	35.3	28.8	60.9	0.5	0.4	0.3	0.9	0.8	1.1	36.8	32.2	30.0	62.3
2d quarter	0.4	0.1	-	66.1	46.6	106.4	1.5	0.9	1.1	2.0	1.4	2.1	70.0	60.0	49.0	109.5
July	-	-	-	46.4	23.4	50.7	0.6	0.4	0.4	1.5	1.5	1.9	48.4	39.5	25.3	53.0
August	0.1	3/	3/	43.8	16.5	57.2	0.7	0.5	0.7	1.7	0.8	1.4	46.1	43.8	17.8	59.3
September	0.9	0.9	0.2	27.5	19.6	42.8	0.7	0.3	0.5	1.8	0.9	1.2	30.9	39.4	21.7	44.6
3d quarter	0.9	0.9	0.2	117.6	59.4	150.7	1.9	1.1	1.6	5.0	3.2	4.5	125.4	122.6	64.7	156.9
October	1.6	2.4	-	10.7	7.6	23.9	0.8	0.3	0.7	1.2	1.0	0.7	14.3	13.0	11.3	25.3
November	2.2	1.9	0.3	1.9	1.2	0.7	0.6	0.2	0.3	0.3	0.3	0.5	4.9	3.7	3.6	1.8
December	1.7	0.7		0.6	1.2		0.5	0.3		0.2	0.4		2.9	2.0	2.7	
4th quarter	5.4	5.1		13.1	10.0		2.0	0.9		1.6	1.7		22.1	18.7	17.6	
Total	7.7	6.2		196.8	116.1		6.4	3.8		9.3	7.1		220.3	204.6	133.2	

1/ Less than 50,000 pounds.
2/ Included with April.
3/ Included with September.
4/ Included with unclassified.
Note: Figures may not add to total because of rounding.
1978 figures subject to revision.

Source: NMFS, Resource Statistics Division.

TABLE A16.--U.S. EXPORTS, DOMESTIC INDUSTRIAL USE, AND TOTAL DISAPPEARANCE OF FISH OIL, BY MONTH, 1972-76 AVERAGE, AND 1976-78

	EXPORTS (1)				DOMESTIC DISAPPEARANCE (2)				TOTAL DISAPPEARANCE			
	1972-76 AVERAGE	1976	1977	1978	1972-76 AVERAGE	1976	1977	1978	1972-76 AVERAGE	1976	1977	1978
	MILLION POUNDS											
JANUARY	9.0	9.0	0.7	2.5	2.4	2.9	2.2	3.1	11.4	11.8	2.9	5.7
FEBRUARY	4.7	1.1	1.0	2.4	2.5	3.1	2.7	2.0	7.2	4.2	3.7	4.4
MARCH	3.2	3.2	3.7	2.9	2.4	3.3	3.3	2.3	5.5	6.5	7.0	5.2
1ST QTR	16.9	13.3	5.4	7.8	7.2	9.3	8.1	7.5	24.1	22.6	13.6	15.2
APRIL	1.3	0.1	(3)	2.8	2.7	3.7	3.2	2.8	4.0	3.8	3.2	5.6
MAY	4.7	5.1	1.5	8.5	2.7	3.3	3.3	3.0	7.4	8.5	4.8	11.5
JUNE	22.1	12.4	15.0	16.1	2.7	3.5	2.6	2.7	24.8	15.9	17.7	18.8
2ND QTR	28.1	17.7	16.6	27.4	8.0	10.5	9.1	8.4	36.1	28.2	25.6	35.8
JULY	32.1	33.1	16.9	33.7	2.8	2.3	2.8	3.8	34.9	35.4	18.9	37.5
AUGUST	35.7	35.0	31.5	84.2	3.7	3.4	3.0	3.0	39.4	38.5	34.6	87.1
SEPTEMBER	22.1	42.1	5.7	15.1	3.1	3.9	3.4	3.2	25.2	46.1	9.0	18.3
3RD QTR	89.9	110.3	53.3	133.0	9.6	9.7	9.2	9.9	99.5	119.9	62.5	143.0
OCTOBER	35.3	16.5	6.9	20.8	3.0	3.0	2.4	3.1	38.3	19.5	9.3	23.9
NOVEMBER	12.1	14.6	3.3	15.7	2.8	3.1	3.9	2.3	14.8	17.8	7.2	18.0
DECEMBER	20.1	6.8	5.1		2.5	2.8	2.8		22.5	9.7	7.8	
4TH QTR	67.4	37.9	15.3		8.3	9.0	9.1		75.7	46.9	24.4	
TOTAL	202.2	179.2	90.6		33.1	38.4	35.4		235.4	217.7	126.1	

(1) BEGINNING IN JANUARY 1978, MAY INCLUDE EXPORTS OF WHALE AND SPERM OIL.
(2) INCLUDES MARINE MAMMAL OIL OTHER THAN SPERM OIL AND SOME HYDROGENATED FAT (VEGETABLE AND ANIMAL) AND OTHER FATS AND OILS IN PROCESS.
(3) LESS THAN 50,000 POUNDS.

SOURCE: BUREAU OF THE CENSUS. CURRENT INDUSTRIAL REPORT, FATS AND OILS, PRODUCTION CONSUMPTION AND STOCKS, SERIES: M20K(72-78).

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

Table A17.--U.S. fish oil exports, annual, by country of destination, 1972-78

Country of destination	1972	1973	1974	1975	1976	1977	1978 Jan.-June	1978 Jan.-Oct.
	Thousand pounds							
Canada	2,578	1,181	1,255	1,241	191	312	381	500
Mexico	124	195	309	198	269	284	239	244
Panama	68	-	-	-	-	-	4	4
Argentina	-	-	-	-	-	402	19	32
Colombia	-	10,667	8,846	-	26,598	5,576	1,126	10,561
Belgium/Luxemb.	2,250	1,212	-	4,797	11,305	1,102	9	2,236
Denmark	2,425	-	-	-	-	-	-	-
France	-	8	-	-	-	1,921	3	1,327
Germany, West	26,250	5,511	11,467	12,080	13,855	13,968	3,698	36,899
Italy	-	-	-	-	285	-	-	-
Netherlands	82,220	146,386	147,067	55,408	82,905	52,554	23,987	75,393
Norway	9,171	-	11,038	-	1,323	2,200	-	1,125
Sweden	61,558	37,980	13,889	41,577	2,212	3,272	-	4,335
United Kingdom	11	41,388	4,122	74,628	34,088	7,938	3,536	50,597
Japan	49	22	-	-	-	-	151	247
Lebanon	1,212	2,583	442	1,342	-	-	2	2
South Africa	4,590	-	-	-	5,176	-	-	-
Australia	535	583	561	-	664	696	6	6
Other countries	157	77	125	572	364	408	1,981	5,408
Total	193,198	247,793	199,122	191,843	179,235	90,633	35,143	188,919

Note: Figures may not add to total because of rounding.

Source: Bureau of the Census.

Table A 18--Selected average monthly prices of fish and soybean oils, and price ratio of menhaden oil to soybean oil, 1977-78

Time period	Anchovy 1/	Menhaden 2/	Tuna 3/	Northwest Europe 4/	Soybean 5/	Menhaden oil to soybean oil
	Cents per pound					Price ratio
1977						
January	14.0	18.6	9.3	19.4	20.9	.89
February	14.0	19.2	9.5	20.0	22.4	.86
March	14.0	21.3	9.4	22.5	26.5	.80
April	14.0	23.9	9.5	25.3	29.6	.81
May	14.0	25.6	9.5	26.2	31.3	.82
June	6/	25.6	12.0	24.4	28.3	.90
July	6/	21.4	12.4	21.1	23.8	.90
August	6/	20.0	12.5	19.7	21.1	.95
September	6/	20.0	12.6	18.7	19.2	1.04
October	15.1	19.1	12.8	19.8	18.8	1.01
November	15.5	18.8	11.0	19.2	21.0	.90
December	15.5	19.9	10.5	20.3	22.6	.88
Average	14.5	21.1	10.9	21.4	23.8	.89
1978						
January	6/	20.0	6/	20.1	20.9	.96
February	6/	20.0	6/	20.0	21.6	.93
March	6/	20.6	6/	21.5	26.6	.77
April	6/	21.0	6/	21.6	26.8	.78
May	6/	21.0	6/	21.7	28.8	.73
June	6/	20.9	6/	22.1	26.9	.78
July	6/	20.0	6/	19.7	25.9	.77
August	6/	18.9	6/	19.5	26.3	.72
September	6/	19.2	10.5	20.4	27.8	.69
October	6/	19.7	10.5	20.4	26.7	.74
November	6/	19.8	10.8	19.8	24.9	.79
December	6/	19.4	10.8	18.7	25.8	.75

1/ Crude oil, f.o.b. plants, quoted at Los Angeles.
2/ Crude oil in tank cars; f.o.b. East Coast plants, quoted at New York City.
3/ Crude oil, f.o.b. plants, quoted at Los Angeles.
4/ Crude oil, any origin, at Hamburg.
5/ Crude, tank cars, f.o.b. at Decatur, Ill.
6/ Supplies exhausted, no quotes.

Source: For U.S. prices: NMFS, Resource Statistics Division.
For NW. Europe prices: Oil World ISTA Mielke & Co,. Hamburg, West Germany.
For soybean oil prices: Fats and Oils Situation, U.S. Department of Agriculture.

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